

# MARINE REVIEW.

VOL. IX.

CLEVELAND, O., AND CHICAGO, ILL., MARCH 8, 1894.

No. 10.

## One of the World's Greatest Battle Ships.

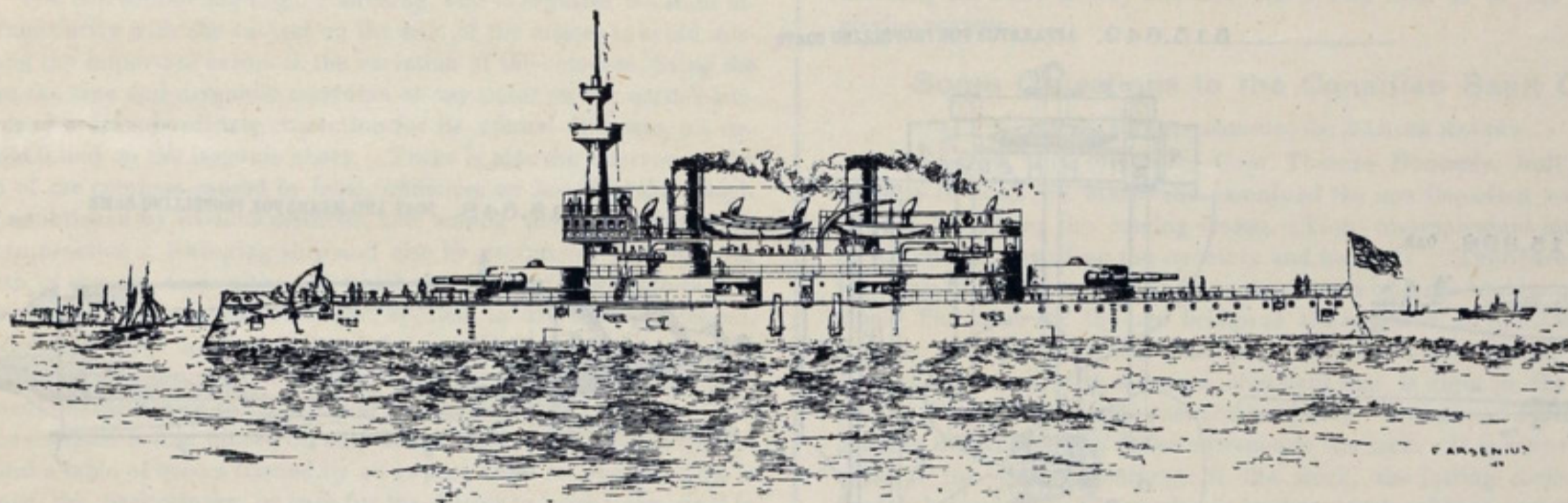
On a preliminary trial, Wednesday, the new United States battle ship *Indiana*, exceeded the speed guaranteed by her builders, the William Cramp and Sons Ship and Engine Building Company of Philadelphia, and there is no doubt that she will rank among the finest battle ships of the world. Three trips were made over the course usually adopted by the Cramps. The first, under natural draft, was accomplished at a speed of 14.1 knots. The second, under half forced draught, in a trifle less than 15 knots, and the third, under forced draught, at 15.35 knots. The guaranteed speed of the *Indiana* is 15 knots. There seems no doubt that the big battle ship will average 16½ knots an hour when the official trial trip is made.

The *Indiana* ranks in size with the British battle ships *Victoria*, *Nile*, *Tafalgar* and *Sanspareil*, but is much superior in power of armor and strength of armament. She is 348 feet long on the water line with an extreme breadth of 69¼ feet, 24 feet draught forward and aft, 10,288 tons displacement, and a normal coal supply of 400 tons. The hull is protected by belts of heavy armor 7½ feet wide, three feet of which is above water. The vessel is cut up forward beneath the water line, making a power-

contains eight corrugated steel furnaces 3 feet internal diameter. The two propellers are of manganese bronze, with adjustable blades, and the coal capacity is 1,800 tons, which will carry the ship 16,000 miles at a 10-knot speed.

## Ore Sales—Lake Freights.

With additional ore sales made during the past week, the companies producing the best Lake Superior ores may now be said to be practically out of the market, having sold about all the ore that they can ship during the coming season. This refers, of course, to the choice of the best ores, including the Norrie, Minnesota, Chandler, Aurora and those of the Colby group on the Gogebic range that had a considerable amount in stock piles. The Minnesota may not be fully sold up but the great bulk of its product is provided for. These sales probably foot up in the aggregate considerably over 2,000,000 tons, but even this large volume of business, based on prices dangerously close to cost of production, does not seem to have as yet made a market for the Missabes or the lower grade ores. No sales of Missabes, aside from the second grade product of the Canton and Iron King, are reported, and although it is doubtful whether some of the big producers of that range would sell at \$2.50,



ful ram bow and doing away with excessive bow waves on account of the easier lines so obtained, as well as greatly adding to the maneuvering qualities.

The main engines are inverted, vertical, direct-acting, triple expansion, with cylinders of 34½, 48 and 75 inches in diameter and 42 inches stroke, and it is estimated that at a piston speed of 9,000 feet per minute, or 129 revolutions, the horse power will be 9,000. The main valves are of the piston type, worked by Stephenson double-bar links; one valve for each high-pressure cylinder, two for each intermediate and four for each low pressure cylinder, the diameter of all the valves being 17 inches. The framing consists of an inverted Y-column at the back of each cylinder and two forged steel cylindrical columns at the front. Each condenser contains 3,788 seamless drawn brass tubes, five-eighths inch outside diameter, giving 6,353 square feet of cooling surface on the outside. The air pumps are of the Blake vertical type, with two steam cylinders 12 inches in diameter, and two water cylinders 25 inches in diameter, the stroke being 18 inches. There are four main and two auxiliary boilers, made of mild steel, of the horizontal return, fire-tube type, and intended for a working pressure of 160 pounds. The main boilers are 15 feet outside diameter and 18 feet long, double-ended and with shells 1½ inch in thickness. Each boiler

there does not seem to be any great demand as yet for the ore, even at that price. One of the Messrs. Oliver of Pittsburg, who control the Missabe Mountain mine was in Cleveland Wednesday, and he said that his company would not produce any more ore than the amount required for their own furnaces, unless they could sell at a better price than that now offered.

A few more freight contracts with Detroit and Cleveland vessel owners have been closed during the week at 80 cents from the head of Lake Superior, but as the ore that has been sold will be carried largely by vessels controlled within the offices of the ore companies, the amount taken by outsiders is, after all, not very large in proportion to the entire volume of business expected for the season. It is admitted on all hands that any improvement over the present conditions must result greatly to the disadvantage of vessels that have taken 80 cent ore. At the best there is only a small proportion of the lake fleet that can run on such a freight and meet expenses, aside from any return on the money invested. The different phases on the subject have been fully discussed, and numerous cases of big steamers showing higher carrying charges have been quoted. It is on this account that twenty or more owners of the largest fleets on the lakes who have not taken any of the ore might be named.

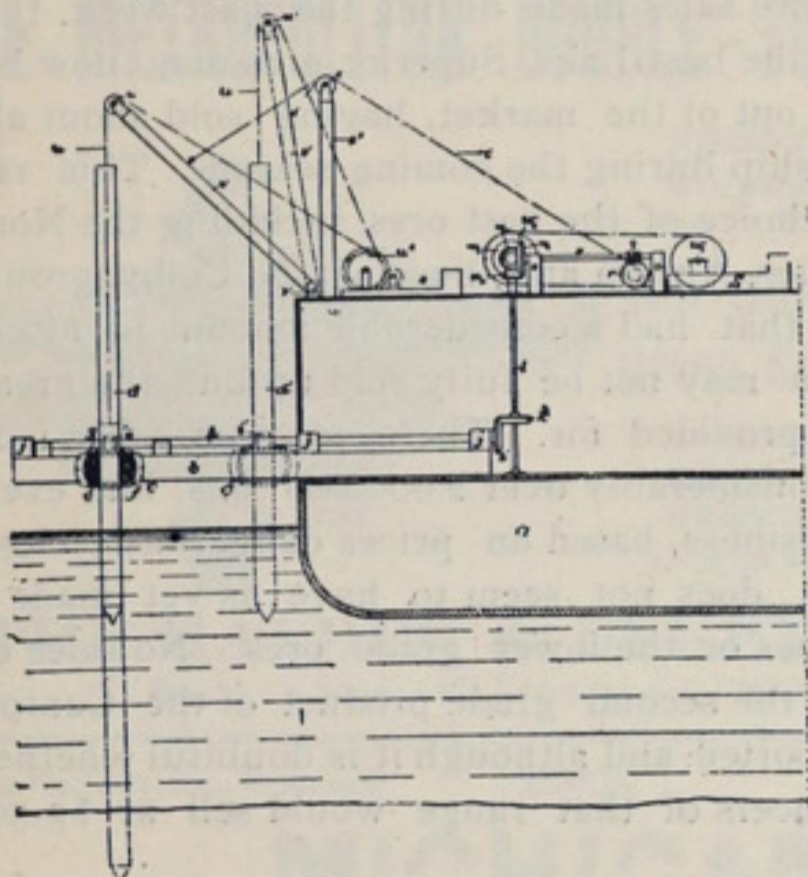
## Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM  
LATEST PATENT OFFICE REPORTS.

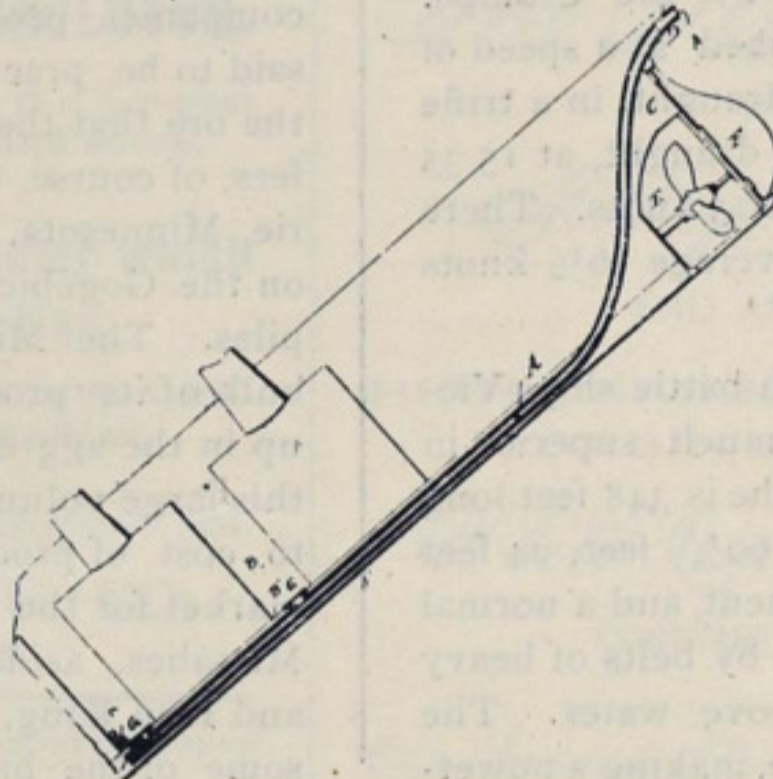
**515,379. DREDGING MACHINE.** George H. Titcomb, Boston, Mass. Filed Jan. 14, 1893.  
Serial No. 458,333. (No model.)

Claim: First, a dredging machine, comprising a vessel, a spud-guide located outside of the vessel and having a ball-and-socket connection with the vessel, and a spud vertically movable in said guide. Second, in a dredging machine, the combination of a vessel having a projecting frame whose side bars form slide-ways, a spud-guide horizontally movable in said ways and carrying screw-threaded ears or fixed nuts, screw-shafts extending longitudinally of the frame and supported in bearings thereon, said shafts engaging the screw-threaded ears on the spud-guide, means for turning the said shafts and thereby moving the spud-guide longitudinally of its supporting frame, and a spud carried on said guide.

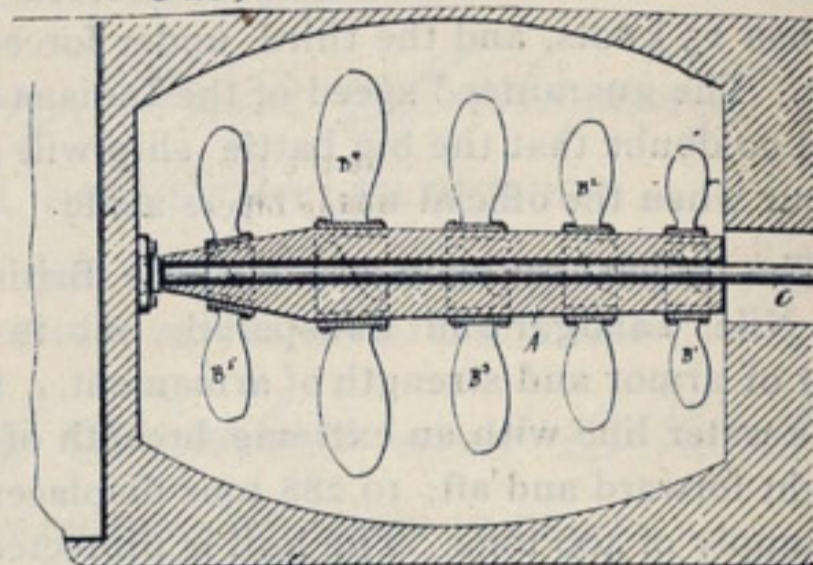
515,379. DREDGING-MACHINE



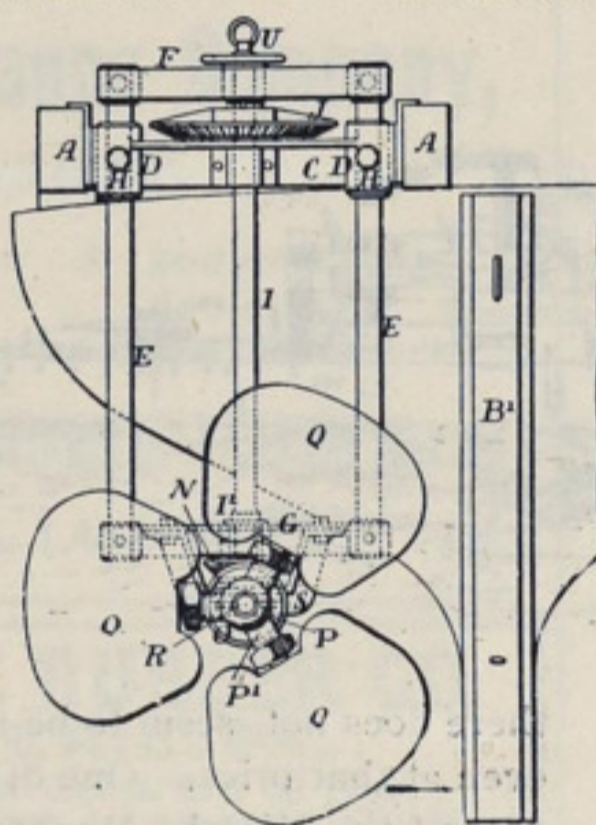
515,480. DEVICE FOR REMOVING ASHES



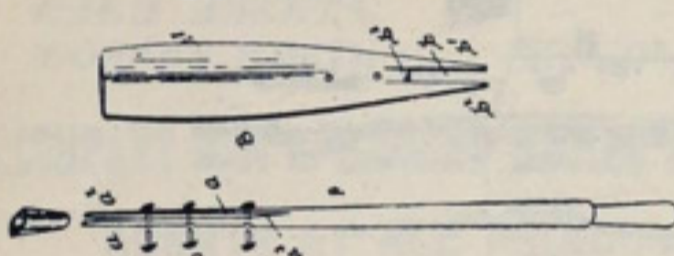
515,479. SCREW-PROPELLER



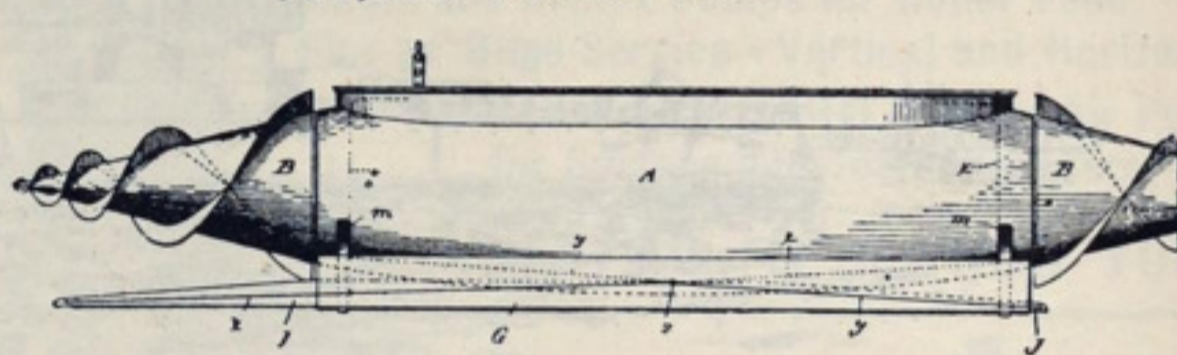
515,642. APPARATUS FOR PROPELLING BOATS



515,398. OAR



515,548. BOAT AND MEANS FOR PROPELLING SAME



**514,480. DEVICE FOR REMOVING ASHES FROM MARINE STEAM VESSELS.** Max O. Miltzlaß, Eggesin, Germany. Filed March 8, 1893. Serial No. 465,112. (No model.)

Claim: A marine vessel having an ash-conducting chute extending along the bottom of the vessel from the furnace room to the stern and terminating at the stern at a point above and beyond the propeller, which chute has well holes in the furnace room.

**515,479. SCREW PROPELLER.** Max O. Miltzlaß, Eggesin, Germany. Filed March 8, 1893. Serial No. 465,111. (No model.)

Claim: A screw propeller, composed of a hub increasing in diameter from the front end to a point about a quarter of the length of the hub from the rear end, a series of blades secured on said hub, the length of the blades increasing from the front of the hub to the greatest diameter of the same and then decreasing toward the rear.

**515,398. OAR.** Jasper N. Dodge, Detroit, Mich. Filed March 10, 1893. Serial No. 465,376. (No model.)

Claim: An oar having the handle and blade constructed of separate pieces of wood, the handle constructed with a kerf *a* to receive the end of the blade, and the blade provided with a recess *b* to receive the adjacent portion of the handle, and a ferrule located over the adjacent ends of the handle and blade.

**515,642. APPARATUS FOR PROPELLING BOATS.** Henry Bancroft, Newry, Ireland. Filed June 15, 1893. Serial No. 477,740. (No model.) Patented in England Sept. 1, 1892, No. 15,693; in France June 6, 1893, No. 230,660, and in Germany June 9, 1893, No. 73,239.

Claim: In apparatus for propelling boats and other navigable vessels by

means of propellers carried by a frame overhanging the stern of the boat, the combination of horizontal bearers *A A* overhanging the stern of the boat, a frame adjustably secured to the bearers by loop or eye bolts passing longitudinally through the beams *A* and adapted to nip the said frame against the ends of the bearers, so as to secure the same in an easily removable manner, a grooved shaft *I* carried in bearings at the upper and lower ends of the said frame, bevel gear *J N* on the said shaft, an axis *R* projecting on the outer side of the lower part of said frame, and a single set of propeller blades *Q* carried by a boss running loose on the axis *R* and having a bevel wheel *O* gearing with the bevel wheel *N* on the shaft.

**515,548. BOAT AND MEANS FOR PROPELLING SAME.** Agustin Marty, San Francisco, Cal., assignor of one-half to Rene Jannin Lecomte, New York, N. Y. Filed Aug. 3, 1891. Serial No. 401,616. (No model.)

Claim: First, the combination of a boat hull, propellers carried thereby, mechanism adapted to be held by the water in a comparatively stationary

manner with relation to the oscillation of the hull of the boat whereby a movement of the hull of the boat around its longitudinal axis with relation to the said comparatively stationary mechanism, will cause the propellers to be operated. Second, the combination of boat hull *A*, propellers *B* carried thereby, main driving shaft *C*, frame *F*, wings *G* connected therewith, and adapted to hold said frame comparatively stationary with relation to the oscillations of said hull *A*, means for propelling the main driving shaft by the movement of the hull with relation to said frame and multiple gear interposed between said propelling mechanism and the main driving shaft.

### The "Providence" Capstans in Europe.

About ten days ago the American Ship Windlass Company, of Providence, R. I., received orders from their agents in Liverpool for two No. D "Providence" power capstans to go on a large ship building in Glasgow, and also an order for a yacht bronze capstan for a yacht building at the same place for Mr. Laidlaw. On Saturday last they received a cable order from their agents for three No. E "Providence" power capstans to go on another large ship building at Glasgow. The continued and increasing orders for the "Providence" capstans in Europe show how these machines are regarded in that country.

Donald M. McKenzie, superintendent of the Sault canal is east on a visit. Vesselmen were very well pleased last season with the new force of assistant superintendents. While always looking after the government interests, Superintendent McKenzie endeavored to please the vesselmen and was successful in doing so.

### Some Points on Lake Navigation.

BY COMMANDER J. J. BRICE, UNITED STATES NAVY.

On a trip around Lake Michigan last spring for the purpose of examining and replacing the buoys, my attention was drawn to the large number of wrecks of recent date. A wreck to a seaman is a matter of more than ordinary interest, and always a subject of speculation as to the cause, especially in these waters where attention is called to the severity of the gales, characterizing the lakes as treacherous bodies of water on which navigation is more dangerous than elsewhere. Violent gales occur in all parts of the world, but the disasters in this region appear to be out of all proportion to the action of the elements and lead us to look for a different solution of the problem of their origin. The cyclone and other phenomena are well understood by prudent and well informed seamen in these days, and their danger disarmed by a familiarity with the laws of storms and a careful study of the barometer. Consequently, our curiosity is excited to further investigation in regard to the annual losses on the lakes which may be due, in a measure, to other causes.

In navigating upon the ocean, there are two important auxiliaries to the navigator—the chronometer and compass. His entire voyage is devoted to the study and watchful care of these instruments, and upon their precision depends the safety of the vessel and those on board. In lake sailing the first of these instruments, the chronometer, and its care, are eliminated, and the compass alone is left necessary for navigating, and upon its accuracy depends the safety of the ship and crew. From early times the compass has been the guide to the navigator. Columbus made the preliminary discoveries of its variation, which has led up to a study requiring officers of high scientific attainments to conduct the work in our own and foreign navy departments, and since the construction of iron and steel ships, the importance of this duty has come into special prominence. The use of the magnet and other appliances to neutralize the effect of foreign substances on the compass has been introduced with wonderful effect, and its study has developed into a science both interesting and abstruse.

Without sufficient care and knowledge, the compass is a most uncertain instrument and becomes an element of safety only in the hands of a master or navigator who understands its errors, and how to find and apply them. Under these conditions alone can any vessel be navigated upon the lakes or elsewhere with safety. The corrections are often confusing, and it requires constant attention and familiarity with the subject on the part of the master to avoid mistakes. Among the important errors is the variation of the compass, being the angle between the true and magnetic meridian at any point on the earth's surface. This also has its subordinate correction for its annual increase or decrease which is found on the isogonic chart. There is also the correction for the deviation of the compass caused by local influences on board of the vessel. The latter is established by various methods, and among them the following are the most in practice: Swinging ship and also by reciprocal bearings; or by the azimuth of the sun, from either of which the curve of deviation is projected and the table of errors constructed and applied to all courses steered. The heeling error, to which much attention is being paid, is an important correction, and is at its maximum when the ship heads north or south, the north end of the needle being drawn to the weather or elevated side.

When the compass is first placed on ship board, it is of late years adjusted by magnets and a table of errors framed by an expert from on shore. This is in reality only the preliminary or base for the master to work upon, as it is his duty to be able to verify the errors in order to have confidence in the instrument and to be sufficiently instructed to detect any change, and in no case trust to others in this most important part of his professional requirements. After the deviation table has been made, showing the deviation on the ship's head for each point of the compass, the same is applied to every course steered, and verified daily in clear weather whenever a new course is laid by observations of the sun and the use of the azimuth tables. The careful navigator takes daily observations at sea for the purpose of determining the deviation of the compass in order that his course may be accurately shaped and the danger of error eliminated at the critical time of nearing the land. In other words, during the entire voyage he has been preparing with great care to meet the conditions which are normal with the master of a lake vessel. Depending on ranges, a prevailing custom on the lakes, is at best the practice of the pilot and not of the navigator. Ranges are of use in a narrow or crooked channel, and with lights at night, but the system when depended upon too much leads the master to forget the compass. In consequence, trouble begins in trying to find the port and ranges with his neglected compass in thick and heavy weather. On the other hand, with a correct compass he is sure of making the port, and when land is sighted the position of the vessel is kept by constant cross bearings of known points, which are plotted on the chart, and the ship steered with safety. This is without contradiction, because the navigator is dealing with well established facts placed before him on the chart, and is not required to depend upon memory or hearsay, as in the case of ranges; besides familiarity with the use of charts and cross bearings enables him to enter any port with safety, whether he has been there before or not.

The barometer is another feature in navigation and gives a faithful record, warning the mariner to seek a harbor or reduce sail and prepare for the approaching change. A careful study of the barometer in different latitudes, is necessary to ascertain the true meaning of the various changes. Schooners

and other sailing vessels on the lakes appear to be the greatest sufferers from bad weather, either by stranding on a lee shore or foundering off the coast. Some of these vessels, according to the reports, are old and unseaworthy, and their loss goes to magnify the dangers of the lakes when in reality it is a wonder they have been kept afloat so long. A prudent seaman in a sailing vessel will keep away from the land in a threatening gale and steer for deep water, if he has confidence in his compass. On the contrary, if he is uncertain of the latter, the inclination is to hug the coast line, and the result is often a lee shore and a wreck.

There are no tides and currents for the master to contend with on the lakes, and these are the most uncertain of all elements for the navigator to calculate and allow for, which reduces very much the per cent. of danger in lake navigation.

The necessity for marine schools in the east has long been recognized, and many of the larger cities have provided means for instructing officers and others in the merchant marine. There appears to be nothing of the kind here, although the long winters of inactivity afford abundance of time to devote to study and attendance upon lectures. A new survey and new charts, including harbor charts, are absolutely necessary for safer navigation of the lakes; also complete descriptive sailing directions. The present chart of Lake Michigan was an excellent one for its day and time and was constructed under many difficulties compared with the appliances of to-day. Two surveying vessels would find plenty of occupation on Lake Michigan alone for some years to come. The coast survey is well equipped with vessels and appliances for the work, and a corps of skilled officers is available for the purpose. The same also applies to the hydrographic office. To the ship owners on the lakes it makes no difference who does the work, so long as they are provided with charts as correct as those of other waters of the United States.

From the above conclusions, the safe navigation of the lakes is confined to a correct compass, with a knowledge and frequent use on the part of the master of the azimuth tables; the precaution to take cross bearings of prominent points and from them plotting the position frequently on the chart; also the familiar use of the chart in laying courses and correcting the same for variation and deviation. There are many well-informed masters of vessels on the lakes familiar with these duties who will concur in the statement as to the necessity for a new survey and new charts, and also as to the usefulness of marine schools.

### Some Objections to the Canadian Sault Canal.

Special correspondence to the MARINE REVIEW.

KINGSTON, Ont., March 8.—Capt. Thomas Donnelly, hull inspector, was recently in Sault Ste. Marie and examined the new Canadian canal, which is to be in use during the coming season. Your correspondent interviewed him on his return regarding the structure and he said: "There are two points interesting to mariners, especially to the officers of large boats coming to Kingston. The span for the new bridge at the entrance to the lock is not wide enough. The draw in the American canal is 200 feet and in the Canadian canal but 90 feet, with a square abutment that is right in the center of the canal. It will be a serious menace to vessels. The second objection is in regard to the stone work at the entrance to the lock. It is very rough and because of the uneven character of the work, the jutting rocks will prevent fenders being used. The result will be that vessels rubbing against the masonry will be injured. The face should be smoothed down and made as level as possible so that fenders would be a sufficient defense for the boats. Outside of these objections the masonry work is the finest I ever viewed."

The government wants the canal finished at an early date and has promised a bonus of \$100,000 if the work is completed on May 1. Capt. Donnelly thinks the contractor will get the money. This is the biggest work Canada has ever tackled and it promises to be quite successful.

In view of the promised completion of the deepening of the St. Lawrence canals to fourteen feet within three years, Montreal shippers are considering the necessity to secure the full benefit of the improvement for that city. One writer holds that a large transfer harbor must be provided at the Lake Erie end of the Welland canal, where the huge steamers running on the upper lakes may have their cargoes transferred rapidly and cheaply into the improved barges carrying about 50,000 bushels of grain each. These barges could go right through to Montreal, and the writer thinks the cost of transport from Port Colborne would be even less than at present from Kingston to Montreal.

The Richelieu and Ontario Navigation Company has not yet selected a manager. Mr. Henry Folger of this city was offered the position at \$8,000 per year but Mr. Folger wanted the company to take the boats of the Thousand Island Steamboat Company and use them in conjunction with other business. The price asked, however, was not such as the Montreal company could accept and the deal is off. Mr. Arthur White, Toronto, and Mr. C. F. Gilderleeve, Kingston, are the candidates now favored for the position.

The rate of wind varies from five miles an hour—a light breeze—to 80 or 100 miles an hour—a hurricane. From 30 to 40 miles an hour is reckoned a high wind; at 50 miles an hour it is called a storm.

## Engineering Questions and Answers.

CONDUCTED BY GEO. C. SHEPARD.

Editors MARINE REVIEW: My L. P. cylinder is 62" diameter and 48" stroke, but working my 5-inch injection valve wide open I can only get 21" vacuum, and my feed water is 120°. Everything seems tight and air pump works well. What is the trouble?  
J. A. D.

Buffalo, N. Y., March 3, 1893.

The data you give is too meager for us to make a very positive answer to your question. Assuming that the initial pressure in the L. P. cylinder is 9 pounds, or 24 pounds absolute, and that you cut off at  $\frac{3}{8}$  stroke, the terminal pressure is 15 pounds at which pressure the weight of one cubic foot is .0387 pounds, and the capacity of the cylinder is 87.6 cubic feet, hence 3.39 pounds is the weight of steam expelled at each half stroke of the piston. Now 27 pounds of water to 1 pound of steam is a safe figure on which to compute the amount of condensing water required, in this case 91.5 pounds for each half stroke, or 14,640 pounds per minute at 80 revolutions per minute. With a vacuum of 24" and a head of 8 feet, this requires an injection orifice of 21.6 square inches, so that, since these calculations are made with a very large margin, 5" is ample diameter, and we would suggest that in fitting out you examine your injection valve and see if it does open wide when the lever is pulled way down. Paint the exhaust pipe with a very thick paint, especially at joints, and examine the air pump to see that the valves all seat tight. Everything else being in good order the construction of the condenser may be such that it cannot form a good vacuum. A thorough mingling of the exhaust steam and injection water is necessary—the more thorough mingling the more vacuum—and to meet the natural tendency of the steam to rise the nozzle should be as high as practicable and should also divide the water into a fine spray or thin ribbons as possible; and then if in falling the water should be intercepted by inclined "baffle" plates arranged in such manner that falling off one in a sheet is caught by the next and so on, while the steam remaining will have to pass through these sheets of water and be further condensed, better results would be obtained than if the nozzle was low in the condenser and the condensation depended upon the spray alone.

Editors MARINE REVIEW: The cards taken from the H. P. and I. P. engines of the boat I was on last fall show a loop on the steam ends. Could you tell me the cause and simple remedy.  
M. E. D., oiler.

Chicago, Ill., March 5, 1894.

Your data is rather incomplete but we will jump at the answer and say that the loop shows that for some reason the steam is forced to a higher pressure than that of the steam chest. An excessive lead would not do that, unless the compression was above what it ought to be, and we are inclined to lay the whole blame at the door of compression caused by too early closure of the exhaust. The remedy for this defect is found in cutting off the inside lap of the valves of the engines in question; how much depends on the stroke of engine, travel of valve and lap of valve.

Mr. Geo. C. Shepard, care MARINE REVIEW: I notice in your article on the slide valve that you make the statement that making the distribution of steam imperfect in the backward motion is of little consequence. Now I would like to disagree with you on this point, because if ever we want a perfect working engine it is when we get on the bottom somewhere and try to back off. That is the only time in my experience that the engine is worked her hardest, and if anything can be done with her valves that will enable her to develop a lot of power for a little while let it be done.  
S. E. A.

Alpena, Mich., March 3, 1894.

The fundamental principles concerning the propulsion of steam vessels and the performance of marine engines were propounded in the seventeenth century—long before the discovery of the utility of steam—by Sir Isaac Newton in his Principia at a time when breezes and the brawn of oarsmen were the powers that moved, and a horse power was that developed by a good animal at the end of a sweep turning a windlass to raise coal from the mines, and, thoroughly demonstrated by the experience of centuries, they stand today, as then, true to all motions of matter, men and society. In Newton's own words they read:

1. Every body continues in its state of rest or of uniform motion in a straight line, except in so far as it may be compelled by an impressed force to change that state.
2. Change of motion is proportional to the impressed force and takes place in the straight line in which the force acts.
3. To every action there is always an equal and contrary reaction.

To "Harry," New York: Your questions and cards received but before attempting to answer would ask the sequence of rotation of the cranks and the travel of the valves.  
Ed.

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## The Meeting of Steamboat Inspectors.

An advance proof of the circular reporting the proceedings of the recent annual meeting of the board of supervising inspectors of steam vessels has been received from Washington. The board adopted a new form of sample for steel boiler plate which differs materially from the old form of sample and is described by diagrams in the circular.

In the matter of safety valves on water tube boilers an amendment to the rules provides that all spring-loaded safety valves for boilers of this type required to carry a steam pressure exceeding 175 pounds per square inch shall be required to have an area of not less than 1 square inch to 6 square feet of the grate surface of the boiler. This shall be construed to prohibit the use of two safety valves on any water tube boiler, provided the combined area of such valves is equal to that required by rule for one such valve. But in no case shall any spring-loaded valve be used in lieu of the lever weighted safety valve without first having been approved by the board. The lever and fulcrum link must be made of wrought iron or steel, and the knife-edged fulcrum points and bearings for the points must be made of steel and hardened. But the chambers and saddle flanges of this and all other types of safety valves attached to boilers may be made of cast iron or other suitable material.

By a change in the rule prescribing the experience ashore required of applicants for marine engineer licenses, the machinist who has served an apprenticeship and has had three years' experience as a machinist in a marine engine works is placed on an equality with all other machinists, as well as stationary and locomotive engineers and graduates of mechanical schools. All must serve one year on a steamboat before a license can be secured. Formerly the machinist who had served an apprenticeship and three years at his trade in a marine engine works could, according to the rules, obtain a license as second engineer without spending a year aboard a steamer.

Changes in the pilot rules refer entirely to western rivers.

## Enormous Tonnage Increase.

A Detroit vessel owner who claims that the present depression in freights on the lakes is due almost entirely to overproduction of freight carrying tonnage, has prepared, from reports of the United States commissioner of navigation, the following unique summary of tonnage built on the lakes:

For the seven years ending June, 1872.....	304,907
For the seven years ending June, 1879.....	265,905
For the seven years ending June, 1886.....	261,067
For the seven years ending June, 1893.....	630,293

He argues that the conditions are even worse than these figures indicate, for the tonnage built in the first two periods was largely sail, with a load draft of not over 14 feet, and a season's capacity of not over nine trips, while the tonnage built for the last two periods was largely steam (especially is this so for the seven years ending June, 1893), with the load draft fully 15½ feet and a season's capacity of not less than 16 trips. Applying this increased load draft and extra trips to the enormous output of new tonnage for the past seven years, gives a tonnage capacity of over 1,100,000 tons, as compared with the tonnage capacity of not over 900,000 tons for the three previous periods, or the twenty-one years ending June, 1886. For the year ending June, 1887, the first year of the last period, the output of new tonnage was only 56,488 tons, but the average yearly output of the following six years had risen to 95,635 tons, and the banner year ending June, 1891, the output was 111,856 tons. As the financial scare of November occurred in that year, a slight check was experienced, for the output the next year fell to 45,969 tons. The check, however, was only temporary, for the output for the year ending June, 1893, was more than double the preceding year, being 95,635 tons.

These figures are correct, as they correspond with the statements from the office of the commissioner of navigation published of late years in the REVIEW.

At the annual meeting of the board of the supervising inspectors of steam vessels recently concluded in Washington, types of coil and pipe boilers presented by thirty-nine individuals and firms whose names follow were approved: Lewis Saunders, Lawrence, Mass.; Perkins & Richmond, Grand Rapids, Mich.; E. P. Clark, New York, N. Y.; John H. Lutz, Michigan City, Ind.; Henry Haenel, St. Augustine, Fla.; Lee H. Stephens, New Albany, Ind.; I. G. Morgan, Seattle, Wash.; Charles L. Seabury, Nyack, N. Y.; George H. Holmes, Gardiner, Me.; Charles W. Foster, New Haven, Conn.; Babcock & Wilcox, New York, N. Y.; Anson C. Dearing, Detroit, Mich.; the Rochester Machine Tool Works, Rochester, N. Y.; Hampden Hyde, Rochester, N. Y.; Charles DeVore, Philadelphia, Pa.; Emil Volk, New York, N. Y.; J. B. Jardine, San Francisco, Cal.; B. Louis Toquet, Westport, Conn.; L. Boyer's Sons, New York, N. Y.; G. R. Jackson, McKeesport, Pa.; George W. Arrowsmith, Fort Niagara, N. Y.; George L. Wright, North Andover, Mass.; W. W. Moore, Eugene, Ore.; J. J. Driscoll, Stapleton, N. Y.; Charles Ward, Charleston, W. Va. (coil boiler); Charles Ward, Charleston, W. Va., (navy horizontal pipe boiler); R. Muroe, & Son, Pittsburg, Pa.; Samuel T. Williams, Baltimore, Md.; John A. Flajole, Bay City, Mich.; D. Rousseau, New York, N. Y.; the Coulter and Mc Kenzie Machine Company, Bridgeport, Conn.; John J. Brown, Baltimore, Md.; George E. Dow, Seattle, Wash.; L. D. Daais, Erie, Pa.; John A. Duggan, Boston, Mass., (Christiansen Marine Boiler); Robert R. Zell & Co., Baltimore, Md.; D. Y. Williams, South Haven, Mich.; E. U. Gibbs, Elmira, N. Y.

### Around the Lakes.

Mr. F. W. Wheeler of West Bay City was among the guests at the Press Club dinner in New York a few evenings ago.

Managers of the Ship Owners' Dry Dock Company, Cleveland, are preparing for the enlargement of dock No. 1, so as to accommodate the largest steamers on the lakes.

Capt. John Griffin of Toledo has purchased a half interest in the schooner St. Peter from Capt. Frank Alban who sailed her since she was built in Toledo twenty-one years ago.

Capt. McLeod, chief inspector for the Inland Lloyd's Register, has taken up offices in the Atwater building, Cleveland. About 100 boats will require general inspection for the new register.

The Chicago Vessel Owners Association elected the following officers on Saturday last: President, Wiley M. Egan; vice-president, Thomas Hood; treasurer, C. W. Elphicke; secretary, F. B. Higgin.

All of the captains who were in steamers of the Mutual and Menominee lines last season, excepting Capt. Chapman, have been engaged for the coming season. Capt. Chapman will probably take one of the boats of the Wilson Transit line.

Collector of Customs Clark of Chicago has been asked by the treasury department to submit a report on the advisability of making the commander of the new boarding vessel Calumet harbor master in the port of Chicago.

The Portage lake canals will very probably be given an appropriation of \$200,000 in the river and harbor bill soon to come before congress. This is the first installment of a total of \$1,000,000 required for the deepening of the canals to 16 feet.

Among the new vessels entered on the books of the United States commissioner of Navigation last week was the steamer Pentland of Grand Haven, Mich. Her gross tonnage is 827.45 and the net 617.78, while the official number is 150,656.

Perhaps it will be of interest to yachtsmen to know that the famous America's model is in the possession of Capt. D. F. Edwards of Toledo. The model is highly prized by Capt. Edwards, as the builder of the America, Geo. Steers, was an old friend.

Chicago tug owners are reported to have formed a combination for the maintenance of rates, with Capt. Edward VanDalsen a retired owner, as referee. The referees power will, according to report, be autocratic, as there will be no appeal from his decisions.

The passenger steamer Shrewsbury, which has been in the hands of Receiver Geo. G. Hadley of Toledo, will probably be sold by the United States marshal as this method of disposing of her seems to be the only way in which differences between owners and creditors can be settled.

Following are the officers of the Mentor Steamship Company controlling the steamer Hope and consort Fitzpatrick: President, Thomas Fitzpatrick; vice-president, W. H. Barriss; secretary and treasurer, C. C. Hale. The directors are these officers with Guy B. Case and Capt John Mitchell.

According to report from Buffalo the minimum cost of a trip from that port to Duluth on one of the new Northern line passenger steamers will be: Ticket \$19, berth \$4.50, meals \$6, total \$29.50. But a man of means can, if he chooses, have a parlor, with bath that will cost him \$33 in addition to his passage and meals.

Capt. A. D. Campbell of the Michigan City firm of Campbell & Cook, owners of the steamer Vail and barge Baltic, has transferred his interests in these boats to J. H. Pauley of Milwaukee, taking in part payment the steamer Roanoke. The Roanoke figured in the deal at \$28,000, the Vail at \$75,000 and the Baltic at \$50,000.

As the Hay lake channel will be in readiness for vessels of canal draft about June 30 next, the light-house board is making an effort to secure an appropriation for lights and buoys. Plans and specifications have been prepared and the secretary of the treasury has sent a letter to the speaker of the house suggesting the necessity of an immediate appropriation of \$68,557 for the work.

SOME TIME AGO THE MARINE REVIEW PUBLISHED A SHORT HISTORY OF LAKE NAVIGATION, RUNNING THROUGH FIVE NUMBERS. WE HAVE SEVERAL SETS OF COPIES OF THESE NUMBERS WHICH WE WILL FURNISH AT 50 CENTS. ONE OF THE NUMBERS CONTAINS INFORMATION OF LOCKS OF THE ST. LAWRENCE AND ERIE CANALS, WHICH IS WORTH THE PRICE ASKED FOR ALL OF THE NUMBERS.

### Mr. Blanchard on River and Harbor Improvements.

In the North American Review for March Congressman Blanchard of Louisiana, chairman of the river and harbor committee of the house, makes the very strong point that the total amount appropriated for rivers and harbors from the beginning of the government in 1789 to the present time is, in round numbers, \$240,000,000, while the present cash value of railroads constructed in the United States since 1830 is about \$5,000,000,000, and calculating on the basis of this investment in railroads it is a remarkable fact that the amount expended for river and harbor improvements hardly equals what is paid out in one year for repairs and rolling stock on the railways of the country.

### Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on March 4, 1894:

	Wheat, bu.	Corn, bu.
Chicago .....	20,867,000	5,118,000
Duluth.....	10,750,000	176,000
Milwaukee.....	860,000	.....
Detroit.....	1,794,000	34,000
Toledo .....	3,019,000	1,244,000
Buffalo .....	1,645,000	456,000
Total .....	38,935,000	7,028,000

At the points named there is a net increase for the week of 100,000 bushels of wheat and 74,000 bushels of corn.

### In General.

Representative Hunton of Illinois has introduced a bill in congress to place on the retired list officers of the revenue marine service who shall have reached the age of sixty-two years, vacancies thus created to be filled by promotion.

With a view to considering the advisability of using small boats made of aluminum on large vessels of war, the navy department has delegated Constructor Woodward to examine the three boats being constructed of this material at Baltimore for the Wellman arctic expedition.

Mr. Miers Coryell of New York, who has been associated with the Globe Iron Works Company, Cleveland, in the design and construction of engines and boilers for the new Northern Line passenger ships, is about to sail for Europe, to be gone on a business trip for about six weeks.

The sundry civil appropriation bill proposes an expenditure of \$2,000 for printing and issuing charts of the lakes and \$25,000 for surveys, additions to and corrections in engraved plates, this last amount to be available until expended. These items have been urged by the Lake Carriers' Association.

The Belleville boilers fitted on board the Sharpshooter, of the British navy, were subjected to their first trial recently. The water test proved satisfactory to a pressure of 330 pounds per square inch. As the contracted working pressure of the new boilers is 225 pounds, the test proves that they can safely exceed this by at least 100 pounds.

Although denied and reasserted in the past, rumors of a gigantic Atlantic passenger steamer to be built by Harland & Wolff of Belfast for the White Star Line are again revived, as a result of a statement made by the New York representative of the White Star Line to the dock board of that city. In urging the improvement of a portion of the New York water front, the agent of the White Star company said that the construction of a ship 640 feet in length was contemplated for the line.

The tonnage of the new ships of the United States navy now in commission foots up the respectable total of 56,579 tons in displacement, apportioned as follows: New York, 8,150; Baltimore, 4,600; Chicago, 4,500; Philadelphia, 4,324; Monterey, 4,138; Newark, 4,083; San Francisco, 4,083; Charleston, 4,040; Miantonomoh, 3,990; Atlanta, 3,189; Boston, 3,189; Detroit, 2,000; Bennington, 1,700; Concord, 1,700; Yorktown, 1,700; Dolphin, 1,485; Machias, 1,050; Vesuvius, 930; Petrel, 890; Bancroft, 838.

# MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

MR. EUGENE T. CHAMBERLAIN, commissioner of navigation, has addressed communications to some of the lake vessel owners informing them that he had under consideration the question whether distinctive lights should be prescribed by law for use on wrecking vessels when such vessels are moored to or near wrecks. The law now prescribes the use of the ordinary anchor light in such cases. It has been suggested, the commissioner says, that such light is not the best for the purpose; that its use may lead to disaster, and that the vessels should be distinctively lighted so as to indicate more precisely their employment, and the danger to other craft in passing too near them when they are anchored or moored at a wreck. It is more than probable that the answers to these communications from lake vessel owners were decidedly adverse to any change in the present regulations. It is certainly the opinion of most people concerned that the system of lights is already too complicated.

IN ANOTHER part of this issue there is printed an article on lake navigation from Commander J. J. Brice, United States navy, who was, up to a short time ago, in charge of the Lake Michigan light-house district, with headquarters in Chicago, but who will sail from San Francisco for Honolulu on the 17th inst. in command of the U. S. S. Adams. Commander Brice's conclusions regarding the requirements in lake navigation, and especially that part of the article suggesting the necessity of a more general knowledge of the compass, are worthy of careful consideration from men engaged in sailing lake vessels. He suggests moderate advances in matters pertaining to the science of navigation that can well be applied to the lakes. Commander Brice made many friends in Chicago and other lake cities while in charge of the Lake Michigan district. His course in all dealings with vessel owners was highly commendatory, and he leaves with their best wishes for future prosperity.

WE CAN hardly believe that the national association of marine engineers has anything to do with the bill in congress, introduced by Mr. Ellis of Oregon, which aims to make naphtha launches, of which there are probably a couple of thousand in this country, amenable to the steamboat inspection laws. The proposed law, entailing the employment of engineers and necessitating compliance with numerous regulations that would be absurd in connection with these small pleasure craft, is beneath the consideration, let alone the support, of a body like the national association of marine engineers, and it is to be hoped that an official denial will be made of the reports connecting the engineers with the measure. There is little probability of the bill becoming law.

THE ADVERSE report of the naval affairs committee of the House of Representatives on the resolution of Congressman Holman, providing for an investigation of the premium system in

the construction of war vessels, is a document that will be found interesting by ship builders generally. Of course, the resolution is a thing of the past, as the committee learned that one J. Hale Sypher was back of the movement for an investigation, with questionable motives in view, and they showed up his reputation in a very unenviable manner, but the report in itself is valuable for the great mass of information which it contains on the subject of premiums paid to contractors of war vessels for the navy.

AT LAST the commercial bodies in lake cities have shown some interest in the matter of reforming the customs laws governing the entering and clearing of cargoes at lake ports. Chambers of commerce in Toledo and Cleveland have, within the past few days, passed resolutions endorsing the measure now before congress which has this end in view, and which as been referred to several times of late in these columns.

## Regulations for the Inspection of Boiler Plate.

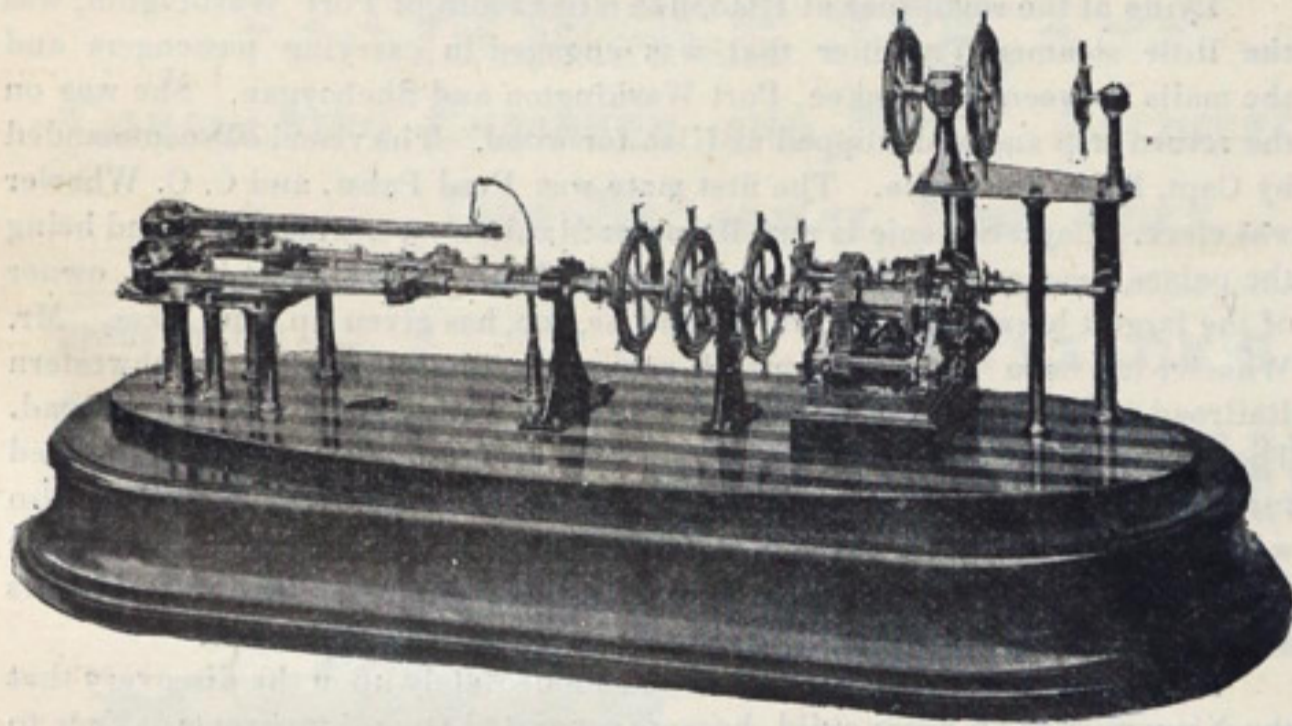
James A. Dumont, supervising inspector-general of steam vessels, has issued the following regulations for carrying into effect the recent act of congress authorizing him to detail assistant inspectors to inspect iron or steel boiler plates at the works of the manufacturers:

"Manufacturers of boiler plate, steel or iron, requiring the services of an assistant inspector, under the provisions of this act, must make application to the supervising inspector-general direct by mail or telegram, stating, when applications are by mail, the number of plates to be tested, the name and address of the boiler manufacturer, the local inspection district in which said manufactory is located, accompanied with a duplicate of the boiler manufacturer's order containing size and description of plates required, tensile strength, etc. When application is made by telegram, the details described must be furnished the assistant inspector who may be detailed to make the required tests previous to such tests being made. Coupons for testing, unless cut off in the presence of the assistant inspector, must be stamped with the manufacturer's stamp at each end of the coupon in such manner that one-half of such stamp shall show on the coupon at the line of shearing or planing, the other half on the plate on same line in such manner that the assistant inspector may, by matching the coupon to the plate, determine to his satisfaction that the coupon is actually from the plate he is to test. In districts having assistant inspectors, where mills are located in the immediate vicinity of the inspector's office—say within ten miles—the assistant inspector may test as small lots as may be required. When at a greater distance, however, an assistant inspector will not be sent to inspect lots of less than three plates. In cases of lots of three or less plates the material will have to be tested as formerly, namely, by the supervising or local inspector in the district where the plate is to be used.

"Assistant inspectors detailed to test material at the mills will, after making the required tests, place thereon the stamps required by the act referred to herein, one of such stamps to be placed over each of the manufacturer's stamps on such plate, required by section 1, rule 1, rules and regulations, namely: 'At the diagonal corners of each plate, at a distance of about 4 inches from the edges, and at or near the center of the plate' In addition to this, they shall stamp a number of their initials on such plates, so that each plate tested shall be numbered in numerical succession for record, commencing with number 1, the numerical order to be continued in all future lots they may test, so that no one assistant inspector's test shall show duplicate numbered plates. When tests have been completed, the assistant inspectors making the test shall report the same to the supervising inspector-general on blank form 2,173, at the same time sending a duplicate thereof to the local inspectors through the supervising inspector of the district where the material is to be used. Under head of 'remarks' at bottom of blank should be noted whether coupons were cut off in the inspector's presence or otherwise, as shown by a comparison of sections of stamps on coupon and plate."

### Not a New Steering Gear.

Engineering and other technical journals of London devoted considerable space, a short time ago, to describing a steam steering gear manufactured by Napier Bros., limited, of the Windlass Engine Works, Glasgow. The gear was also described and illustrated in our issue of Dec. 14, 1893. The British manufacturers make these claims for their machines: "It is arranged to work direct with a double threaded screw, or, if expediency demands, it may be worked with chain and barrel, operated by



quadrant. The change is easily and quickly made, and either of the arrangements can be worked by steam or hand. By a simple arrangement of the clutches, the mechanism is shifted from screw to chain barrel gear, or disconnected from steam to work by hand."

It would seem that the Glasgow firm has, however, introduced nothing new in this steering gear, as a machine embodying the features that are claimed to be new was built on order from the United States navy by Williamson Bros. of Philadelphia in 1889 for the U. S. S. Philadelphia, and the accompanying illustration is from a model of the gear. The model was made for use in the naval academy at Annapolis.

### An Inevitable Accident.

The United States court of appeals for the sixth circuit has confirmed the action of Judge Swan of the United States district court, Detroit, in dismissing, without having allowed even costs to the claimants, the libel of Charles H. Weeks and others, owners of the barge John Sherman, against the propeller Olympia, owned by the Wilson Transit Company of Cleveland. The Sherman was sunk by collision with the Olympia in Detroit river, just below Walkerville, Ont., on May 8, 1891. The Sherman with the barge Roberts was in tow of the steamer Lowell bound down with lumber, and the Olympia was bound up, coal laden. After reducing speed to pick up the marine reporter at Woodward avenue, Detroit, the Olympia was put at her accustomed full speed, on her course to pass up the Canadian channel to the eastward of Belle Isle. To make this course her wheel was ported and she swung until he had brought Belle Isle on her port bow. When this was accomplished the Olympia and Lowell had not got abreast of each other. The Olympia was then heading under the stern of the Roberts, the Lowell's second vessel. To preserve this course and to check the swing of the steamer, her wheel was starboarded, but failed to break her swing. Seeing this, her master ordered it hard astarboard, but the wire rope broke and the collision occurred. Signals to stop and back and also alarm signals were immediately given by the master of the Olympia. The court held that the proofs acquitted both the Sherman and Olympia of the omission of any measure which would have averted or mitigated the collision after the breaking of the latter's wheel rope. The primary inquiry was whether the cause of the collision was any defect in the equipment of the Olympia against which due care and skill could have provided and the defense on this score of an inevitable accident was sustained.

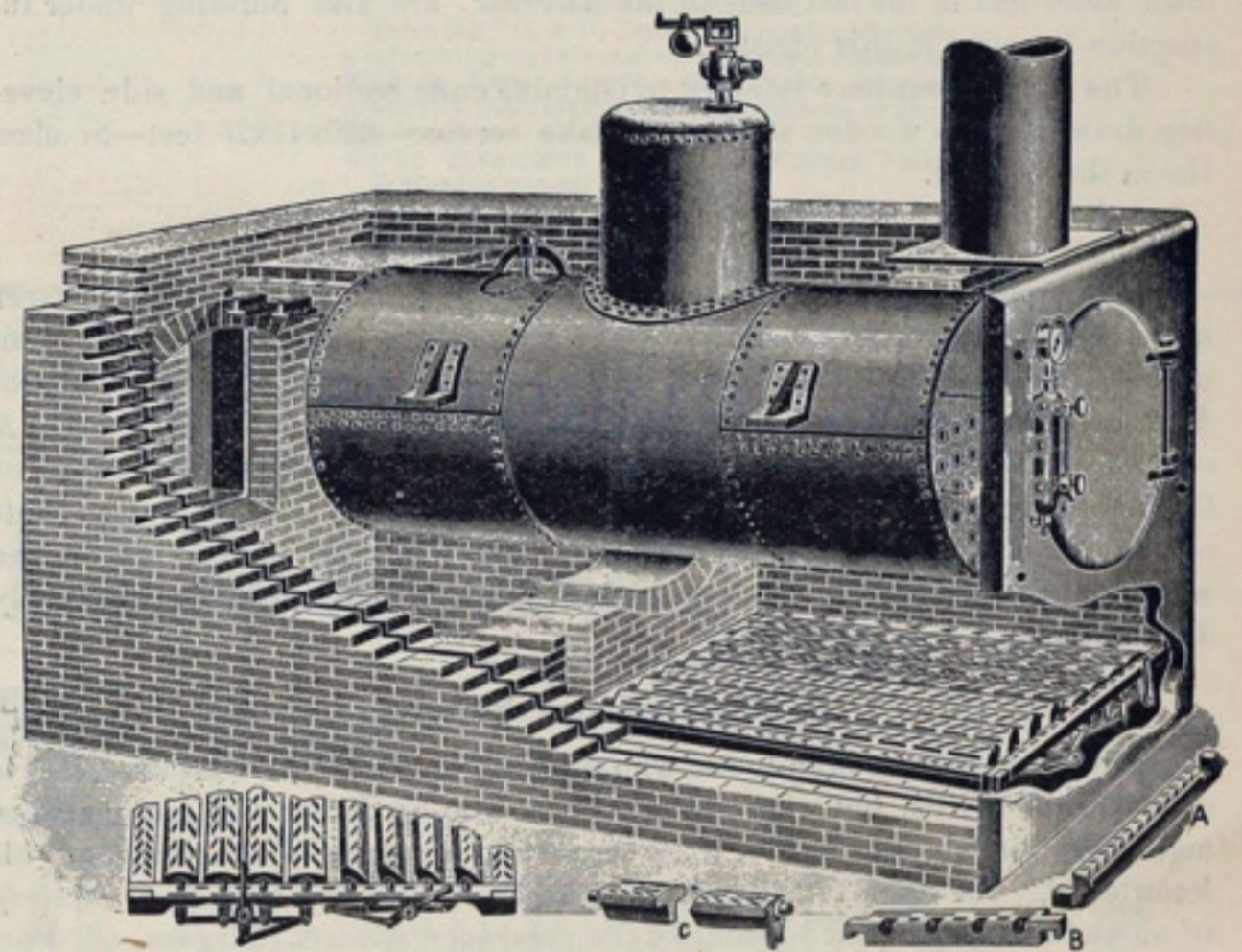
AN ALPHABETICAL LIST OF 1,200 VESSELS—THE BUSINESS FLEET OF THE LAKES—WITH THE PORTS AT WHICH THEY WERE TIED UP FOR THE WINTER, WAS PUBLISHED AS A SUPPLEMENT TO THE REVIEW AFTER THE CLOSE OF NAVIGATION LAST FALL. THIS LIST MAY PROVE SERVICEABLE TO BROKERS, SHIP CHANDLERS AND OTHERS IN PREPARING FOR THE OPENING OF ANOTHER SEASON. FOR 10 CENTS IN STAMPS WE WILL FORWARD A COPY OF THIS LIST TO ANY ADDRESS.

### The Lake Michigan Car Ferries.

Questions have been raised several times as to the success from a commercial standpoint, of the car ferries Ann Arbor No. 1 and No. 2, built by the Craig Ship Building Company of Toledo for the work of transferring loaded railway cars across Lake Michigan, between Frankfort and Kewaunee, for the Toledo, Ann Arbor & Northern Michigan Railway. The financial troubles of the railway company for which the boats were built caused talk of their having been planned in connection with a stock jobbing scheme, and have also prevented the issuance of a statement of the operating cost, etc., under a fair trial of the boats with an active business from the railway, but their performance against the disadvantages of ice and winter storms seems to have come up to all that was expected of them. Capt. Dorrity of the ferry No. 2 says of the boats: "Their sea-going qualities are excellent and their two winters have proven their ice-breaking powers. The device for securing cars is all that could be wished for, and we have no trouble in keeping the cars in place in the roughest weather. They are not what might be called greyhounds, but they make the 65-mile run in 5½ hours." The Kewaunee Enterprise has the following to say of a recent experience of No. 2: "If there ever was any doubt about the practicability of ferrying loaded trains of cars across Lake Michigan, a trip to Frankfort and back made recently ought to satisfy the mind of the most doubting Thomas. The No. 2 left Kewaunee at 9 o'clock Sunday evening in the very teeth of a fierce norther, successfully made Frankfort and set out on the return voyage at 7 o'clock the next morning. The worst gale of the winter was lashing the lake into a white foam and the seas were running high when the big steamer hove in sight about noon, having made the trip across in five hours with a full load of cars."

### A New Rocking Grate.

An illustration of the Columbia clinkerless grate bar under a boiler is shown herewith. It will be found valuable for marine boilers for several reasons, one of which is that the frame is supplied with as much air space as rocking bars, giving additional combustion capacity. The regular air spaces cause the air current to pass through, so that the best possible combustion is produced. This is shown by the fact that much less smoke issues from stacks of steam plants where these grates are in use. The air space in the grate amounts to 65 per cent. Fires do not need cleaning from furnace doors when these



clinkerless grates are used. The doing away with the fire claw, clinker-hook and hoe, makes it necessary to only open the furnace door to put in fuel, and if there was no economy otherwise in the grate this feature would be of considerable importance. If you are troubled with leaky boilers write to the Columbia Grate Manufacturers, 517 Perry-Payne Building, Cleveland, O., giving particulars. It may be the trouble is caused by cold air coming in contact with crown and side sheets and tube ends through excessive opening of the furnace doors. Patents granted August, 1893, cover the improvements.

### Trade Notes.

Work will be begun on the approaches to the new Sault canal lock this summer.

The facilities of Randolph & Clowes at Waterbury, Conn., for the manufacture of seamless tubing are very extensive. They can draw tubing up to forty feet in length, and of the smaller lengths up to sixteen inches diameter.

Captain Vorhis' new passenger catamaran which is to be used on the Shrewsbury river, will have a pair of long stroke stern wheel engines made by Willard of Chicago, and a Roberts boiler built at the works of the company at Red Bank.

### The Light-house Tender Columbine.

Harry C. Lord, engineer of the light-house tender *Columbine*, built by the Globe Iron Works Company, Cleveland, for service on the Pacific coast, speaks very highly of the boat's engines in a letter to the Engineer of New York. He says:

"Our trip from New York to San Francisco with the *Columbine* was a remarkable one, all things considered. Two hours after leaving Bahia, Brazil, I was obliged to stop the engine and slack a low pressure cross-head pin. An oil cup had to be taken off and put on again. The whole operation occupied eleven minutes. This was the only stop we were obliged to make between ports, and with this exception I have not yet had a hot pin or journal. So much for metal running on 32 and 34 wire gauge. We have run nearly 23,000 miles during this time. Our longest run during the voyage to San Francisco was 20 days, 21 hours, and not a stop was made for any cause whatever. I think it speaks well for a new engine."

### Running Three-quarters Missabe,

In a conversation regarding the proportion of Missabe ore that may be used by furnacemen in the future, Mr. G. E. Tenner of the Pittsburg & Fairport Forwarding Company cites a case that is interesting, especially as he is acquainted with the furnace business and is well known among ore dealers. He says that the Haynesworth Steel Company's Edith furnace of Allegheny, which he remodeled and which was put in blast in Feb., 1892, has been running on Bessemer pig for more than three months past, under the management of Mr. John Reis, with three-quarters' mixture of Oliver South Side ore, turning out over 1,700 tons weekly with full success in the product and without accident of any kind. There is no wetting of the ore, he says, and no special arrangement of the furnace or other departure from the ordinary practice.

### Classing Wooden Vessels.

Ratings, valuations, etc., are given to twenty-eight lake vessels in the latest supplement to the Standard Register of New York. The new Davidson vessels at West Bay City are being built under inspection for classification in this register. The society publishing the Standard Register some time ago classed the wooden steamers of the Lehigh Valley line, but the new West Bay City vessels are the first wooden boats to be built under inspection by any of the classification societies. The Old Dominion steamers Jamestown and Yorktown, described in the last issue of the REVIEW, are also building under inspection for class in this register.

The supplement here referred to contains cross sectional and side elevation drawings of a wooden steamer for lake service—320x41x26 feet—to class 100 in the register.

### The Pioneer Mine.

Although little has been heard during the past two years of the Pioneer mine, which adjoins the Chandler on the Vermillion range, it is more than probable that a million tons of ore, fully equal in quality to the Chandler product, will be produced from this property within the next three years. A company in which Oglebay, Norton & Co., Capt. Thomas Wilson and others of Cleveland are leading stockholders, has been engaged in sinking a deep shaft on the property, of which there is 80 acres, and with the coming season ore will be mined in quantity rivaling the best work of the Chandler in its early development.

### A Waif of the Waves.

There is a man in Manitowoc who does not know his own name. He is called Frank Willis, but where he was born, who his father and mother were and where his relatives reside, if he has any, are facts that are beyond his knowledge. He is a mystery to himself and to his acquaintances—a mystery of an awful tragedy—the burning of the passenger steamer *Niagara* off Port Washington in 1856, when over 100 persons perished by fire or met death in the waves of Lake Michigan. The steamer *Niagara* was one of the best boats belonging to the old Collingwood Line in the 50s. She was commanded by Capt. F. S. Miller, a thorough seaman, who knew every point and reef between Collingwood and Chicago. He had spent many seasons on the great lakes without accident, and when his boat left Collingwood on Sept. 22, 1856, she carried nearly 300 passengers. Some were going to seek new homes in the Golden West, while others were returning from business trips or visits to friends by the seaboard.

The *Niagara* had left Sheboygan after landing a quantity of freight and parting with about thirty passengers, and was but about twelve or fourteen hours' run from Chicago. The vessel was staunch, the weather superb and the afternoon was being spent in enjoyment by the 300 persons on board, who were soon to prepare for leaving the steamer. Port Washington had been sighted a few miles distant, when there was a rush of men across the deck and a cry of fire. A minute later a cloud of black smoke rolled upward from amidships, followed by a tongue of flame that leaped from deck to cabin and fore and aft with incredible swiftness. There was the usual panic; the boats were swung over the sides, but before they could be lowered they were filled with crowds that capsized them before they had fairly touched the water. Dozens of the passengers and crew leaped overboard and drowned; others

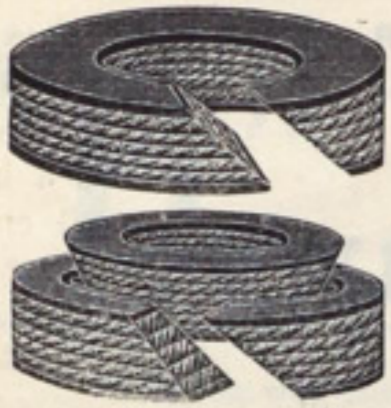
tore cabin and stateroom doors from their fastenings and threw them into the lake and plunged in after them. One large, portly man stood on the rail of the blazing vessel and cried aloud an offer of \$10,000 to the man who would save him; then, crazed by approaching death, he leaped into a crowded boat that boated below him. His weight and momentum capsized the frail craft, already overloaded, and he and the occupants perished. He was ex-Congressman Mocey of Fond du Lac. In those few minutes five score of lives are known to have been lost, and the total number of victims of flame and lake was probably greater than this by two score; but the full horror of the disaster was never learned.

Lying at the small pier at Ulao, five miles south of Port Washington, was the little steamer *Traveller* that was engaged in carrying passengers and the mails between Milwaukee, Port Washington and Sheboygan. She was on the return trip and had stopped at Ulao for wood. The vessel was commanded by Capt. Barney Sweeney. The first mate was Fred Pabst, and C. C. Wheeler was clerk. Capt. Sweeney is now living at Manitowoc, his last command being the palace steamer *Virginia* of the Goodrich Line. Fred Pabst is the owner of the largest brewery in the world, and he, too, has given up the lakes. Mr. Wheeler has been assistant general manager of the Chicago & Northwestern Railroad and is now president of the Chicago, Ft. Madison & Des Moines road. The fire on the *Niagara* was seen by those on the *Traveller*, and she was headed for the burning boat. The schooner *Dan Marble* and the steamer *Illinois* also went to the rescue and a number of lives were saved by all three vessels. The *Niagara* had been headed for the shore, but her engines stopped in ten minutes and she sank four miles from Port Washington in 40 feet of water.

In the terror and panic that followed immediately upon the discovery that the *Niagara* was on fire a child became separated from its parents. Face to face with death, no one had time to think of any but himself, and the child—baby boy apparently hardly two years old—seemed about to be left to the mercy of the flames. There was one man, however, who saw and pitied the little one. His name is not known; all that the record of the hour details is that he was a deck hand. He took the child in his arms and made his way toward the stern. When the fire crowded him and his helpless charge from the deck he swung over the rail, and as the flames approached him there he dropped into the lake. A friendly gang-plank was floating near, and to this the rescuer clung, bearing the child. The narrow piece of timber bearing the babe and the man was overburdened in the mass of wreckage, but the child's friend had a stout heart and he managed to make the shore near the village. Both found friends among the kind hearted people of Port Washington—the man receiving assistance to reach Milwaukee and the child a home. It was thought that though father and mother might have perished, the little stranger surely had friends who would look him up when the disaster became known to the world. But all efforts to find the child's relatives failed, and Frank Collins, the village mason, and his wife accepted the babe as their own child. When rescued the child was dressed in clothes that seemed to indicate that his parents were well-to-do, if not wealthy; everything was of the best. On his neck was a chain with a cross bearing the name "Franc Willette." This clue was of no assistance in establishing identity, but as the boy grew up he was called Franc Willette. He lived with his foster parents until he was 15 years of age when he became Frank Willis and started out to provide for himself in the world. He has made many efforts to learn his parentage, but has never succeeded. The thirty-seven years that have elapsed made the hope of ever discovering the castaway's friends a vain one.

Referring to the published accounts of the inquiry into the wreck of the *Kearsarge*, at which Commander Heyerman broke down in speaking of the love and respect of his men, the Army and Navy Journal says the indication of feeling does honor alike to Commander Heyerman and the men under his command. "It is this personal sentiment of duty, of honor and devotion, that makes a great navy possible. Our jackies may grumble and criticize when the winds blow fair, but in foul weather, and when the spirit of comradeship and self-sacrifice is awakened by adverse fates, they may be depended upon to do their whole duty without murmuring or complaint. It is almost worth the loss of a ship to have such an illustration of the qualities of true manhood as has been given in the case of the *Kearsarge*."

In a communication to the New York Sun dealing with the question of stability of the new vessels of the navy, Charles H. Cramp says that from the day the bids were opened and the award made for the Philadelphia, which was built by the Cramps in accordance with plans submitted by them, the watchword has been "to down the Philadelphia; to damn the only craft designed by a civilian." Mr. Cramp says that if the commanding officer of the Philadelphia, Capt. Rogers, or the admiral whose flag ship she is, Bancroft Gherardi, have any fault to find with her he will meet either or both of them in whatsoever discussion professional courtesy may require, but he would prefer resting her case on her record afloat to taking up a discussion on the basis of any criticism that has as yet appeared in print.



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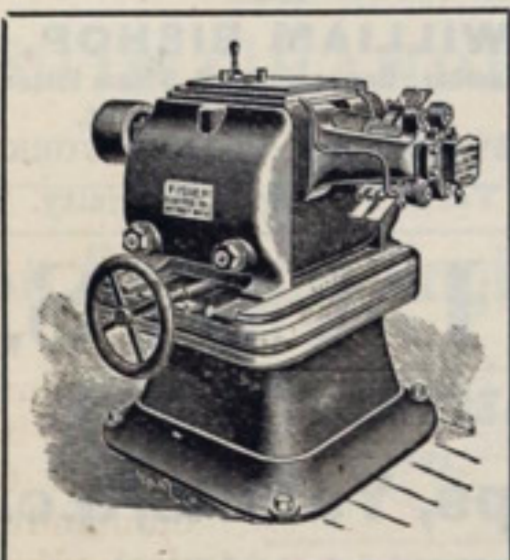
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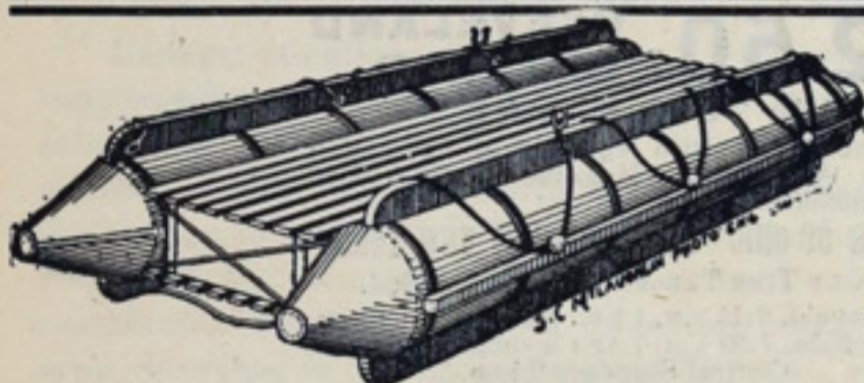
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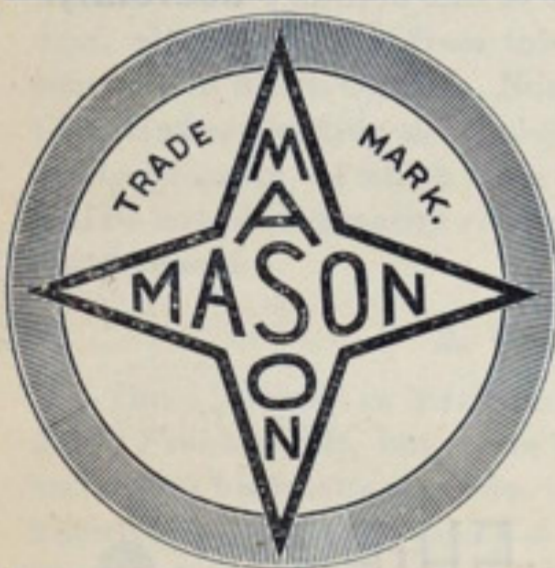
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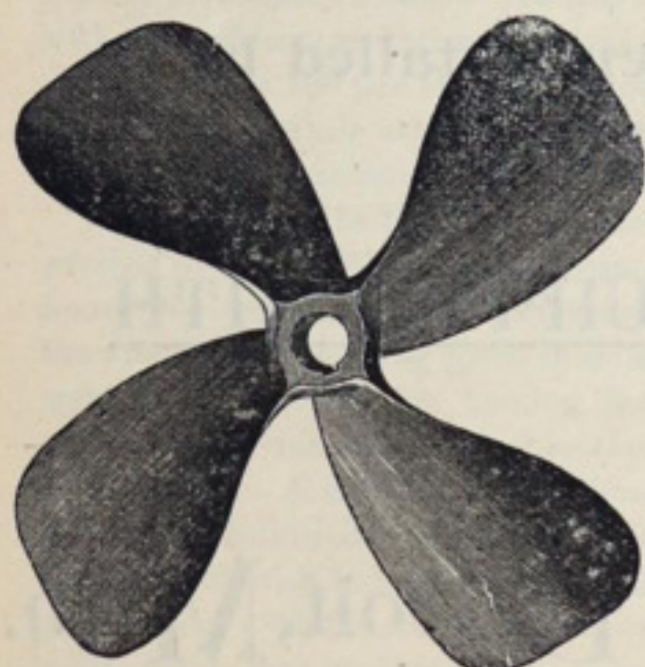
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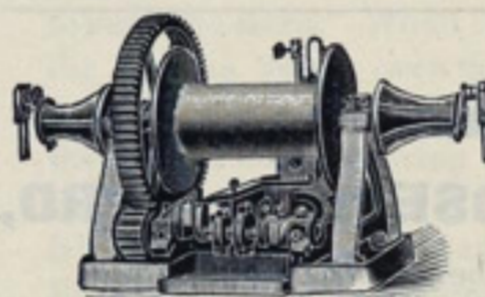
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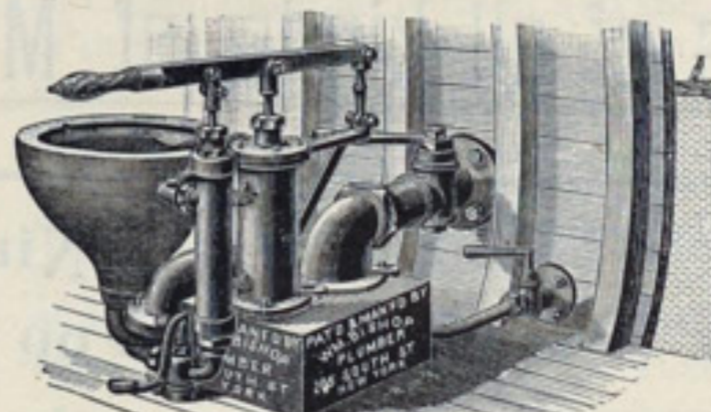
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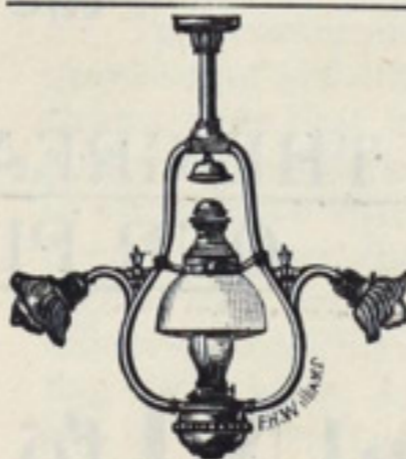
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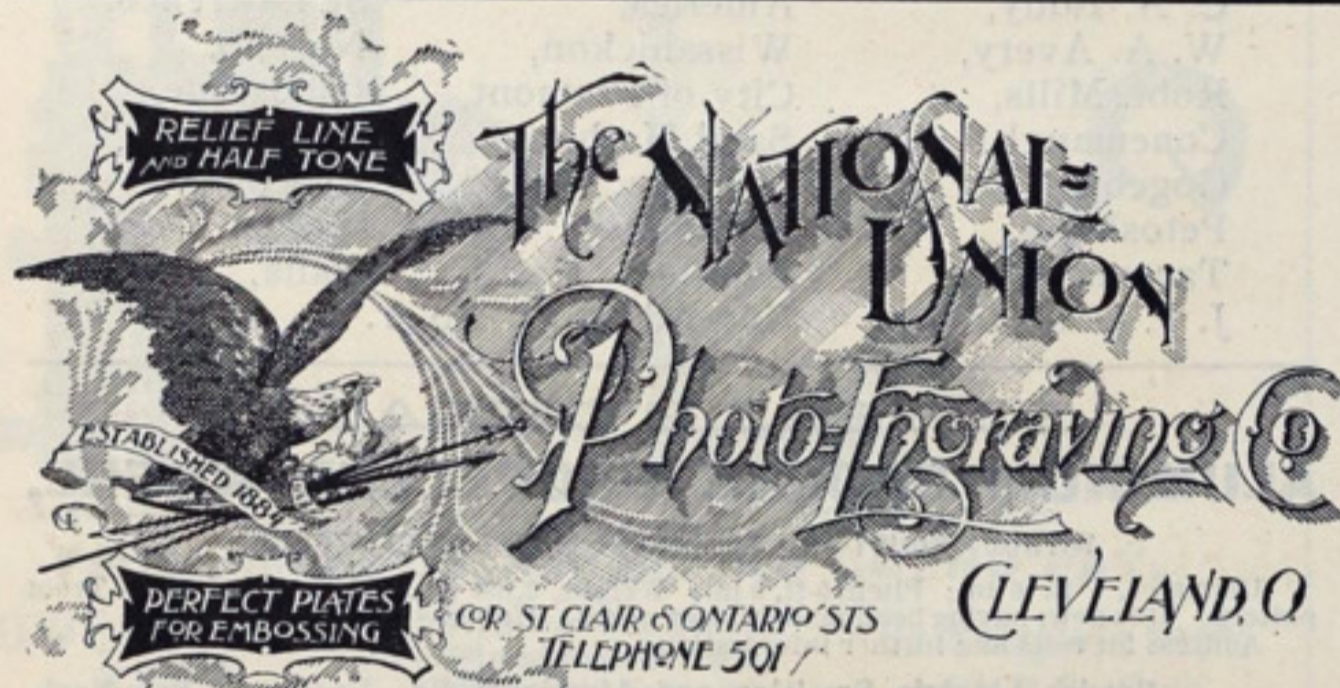
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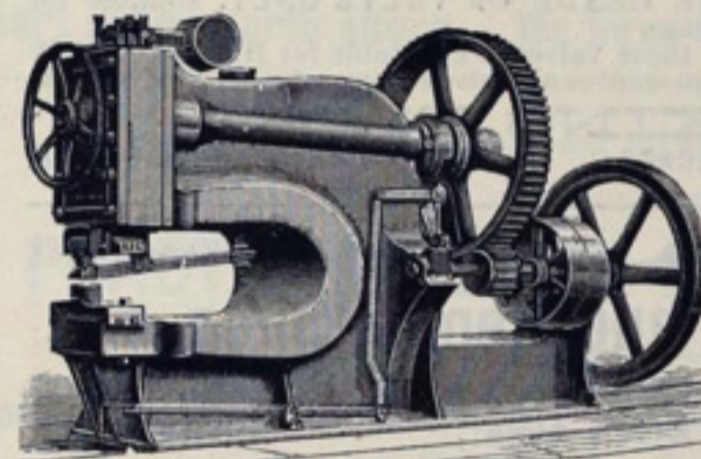
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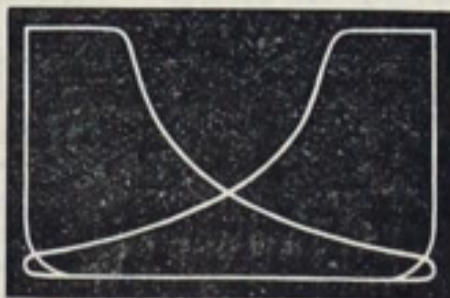
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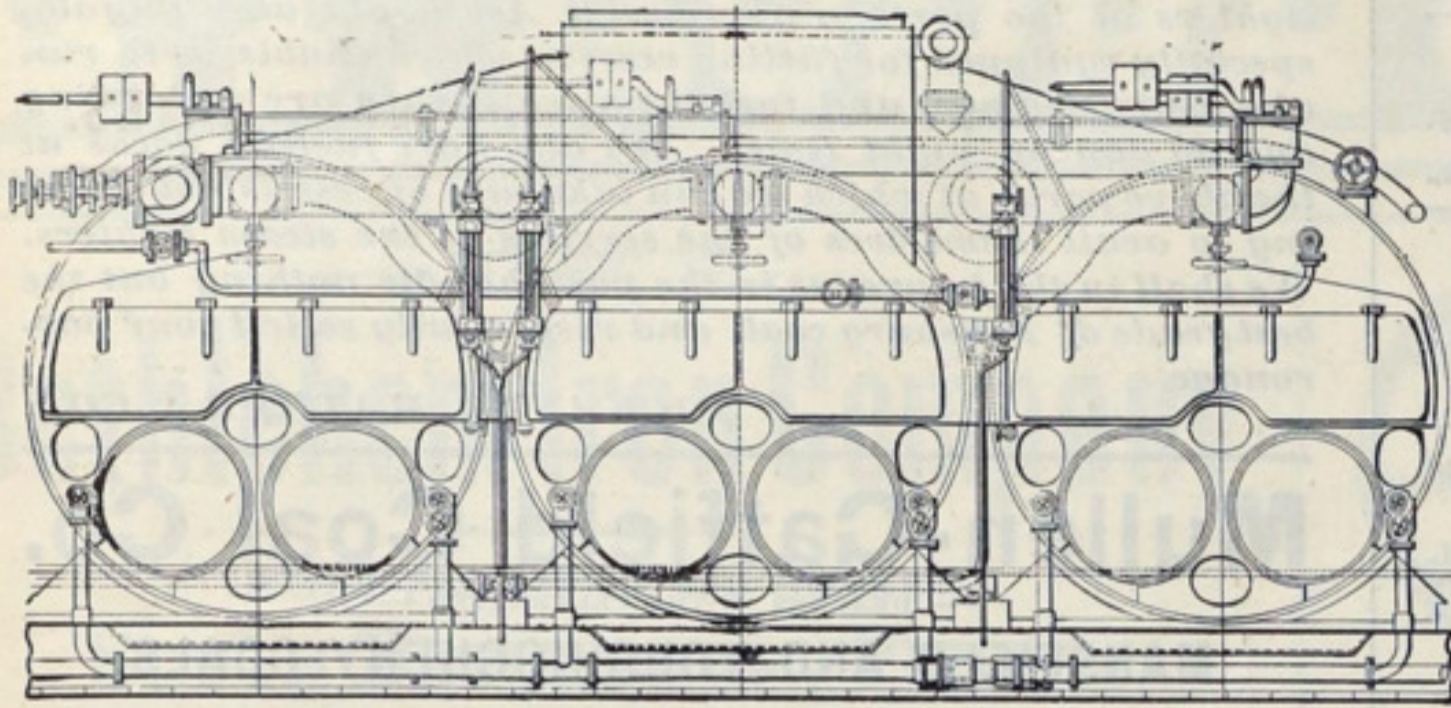
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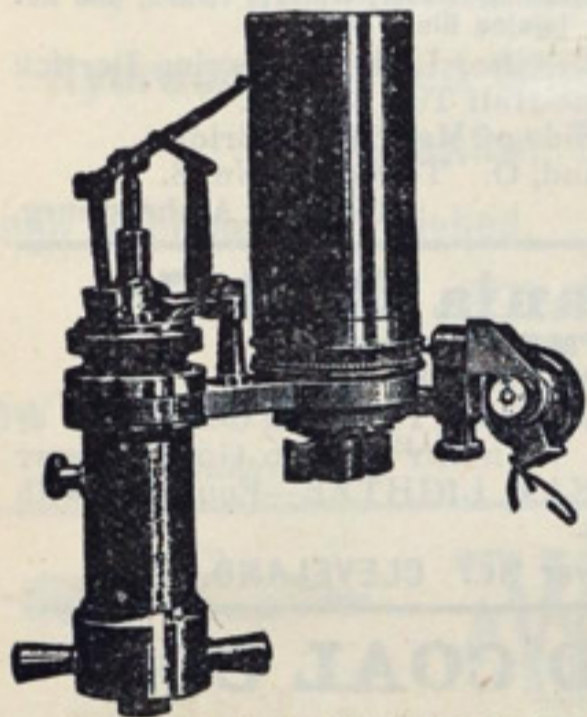
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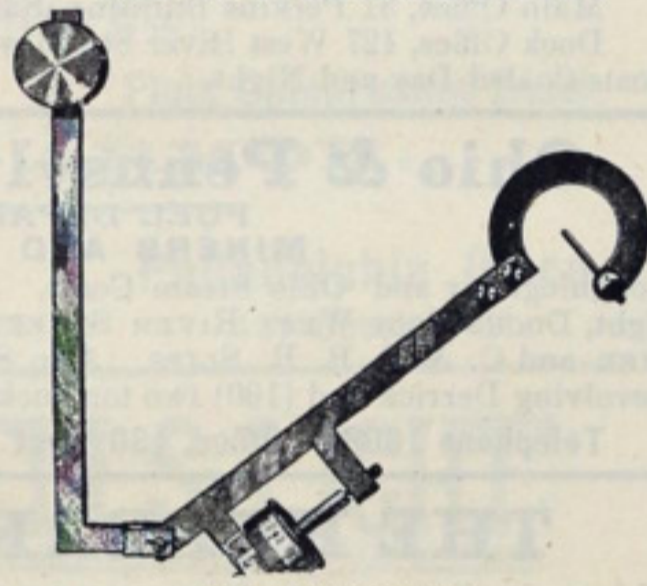
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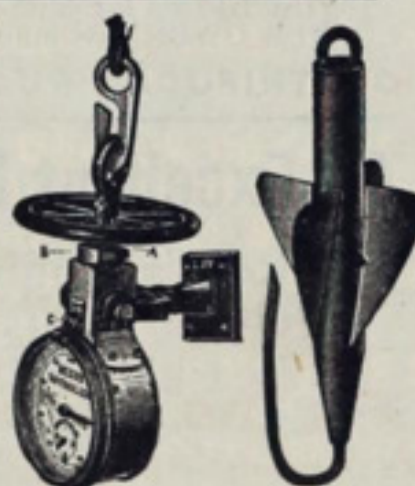
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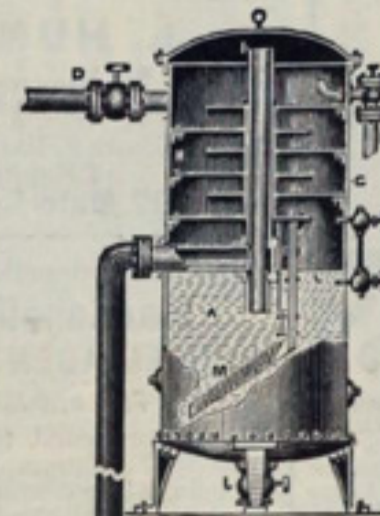
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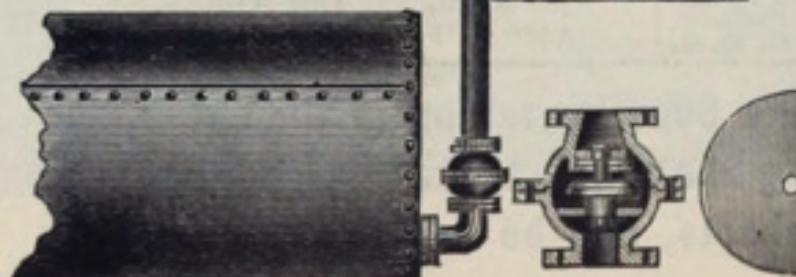
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- A.—Settling chamber.
- B.—Boiler.
- C.—Feed pipe to boiler.
- D.—Steam pipe.
- E.—Water supply pipe.
- F.—Check valve.
- G.—Spray disks.
- H.—Spray chamber.
- I.—Equalizing tube.
- J.—Blow-off pipe.
- K.—Automatic shut-off valve.
- L.—Division plate.
- M.—Deflector and separator.



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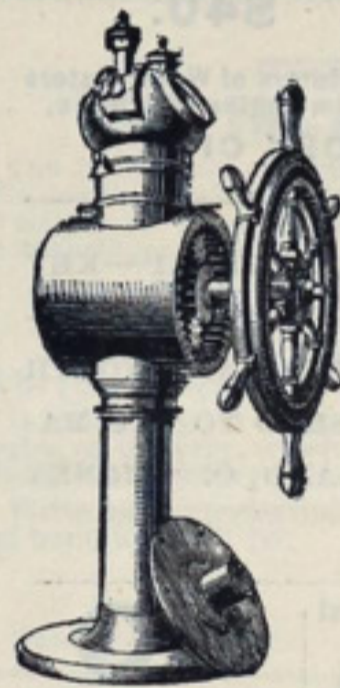
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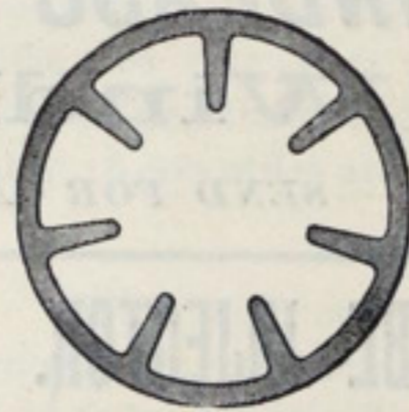
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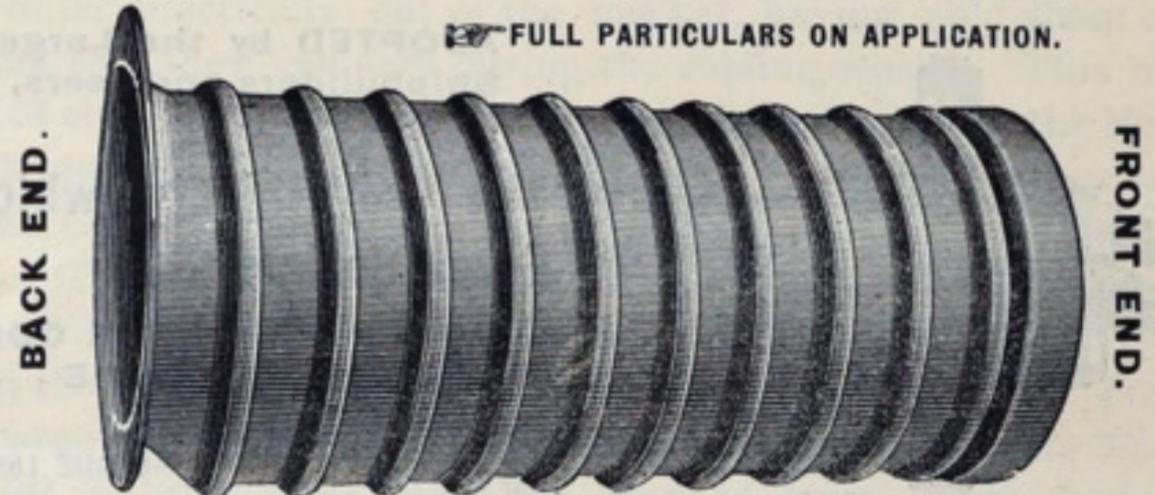
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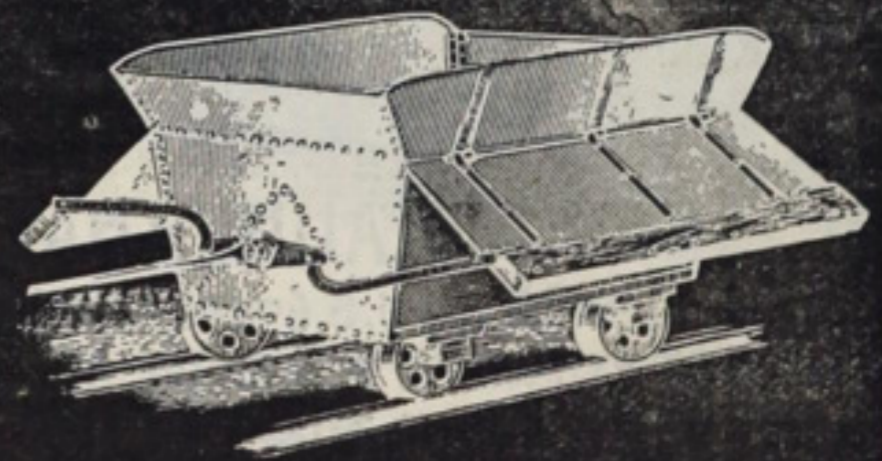
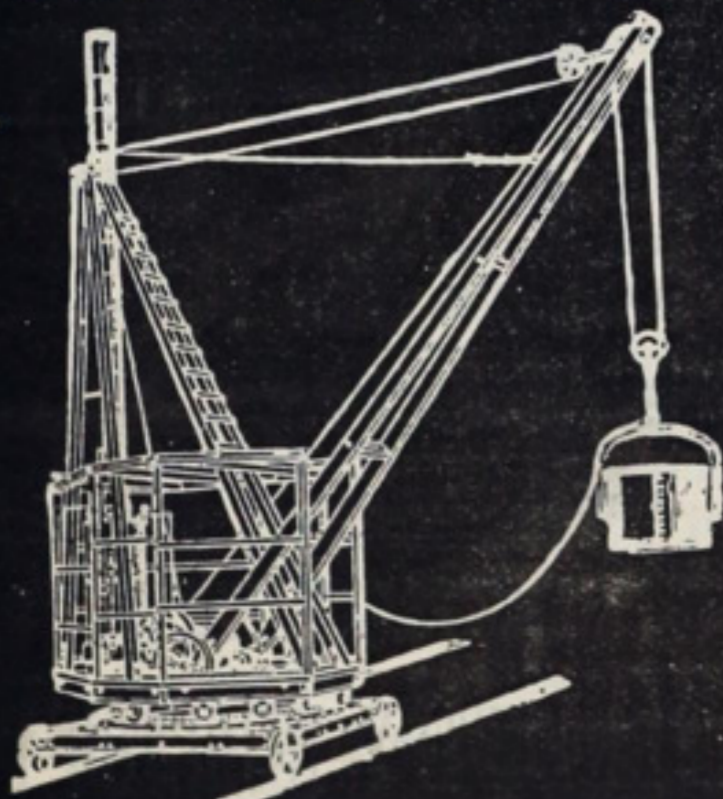
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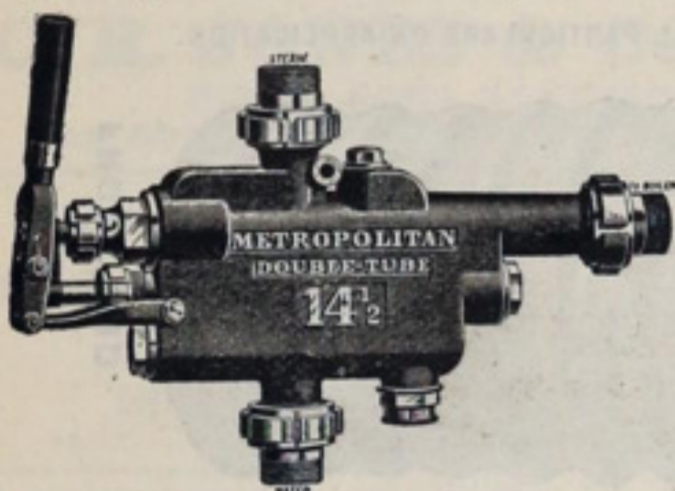
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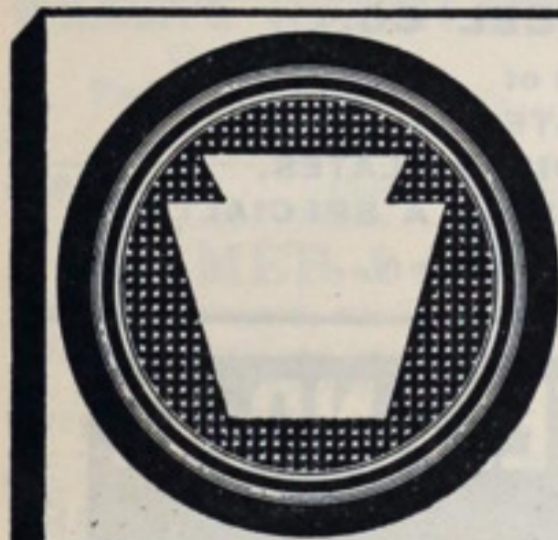
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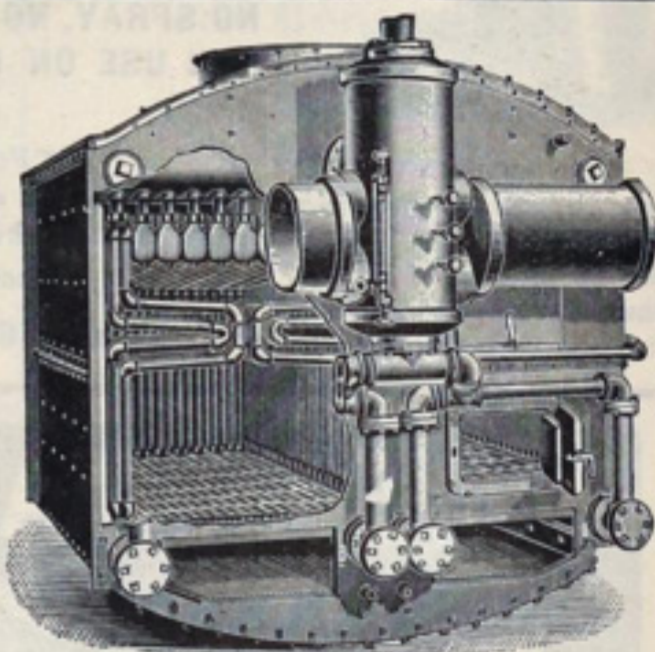
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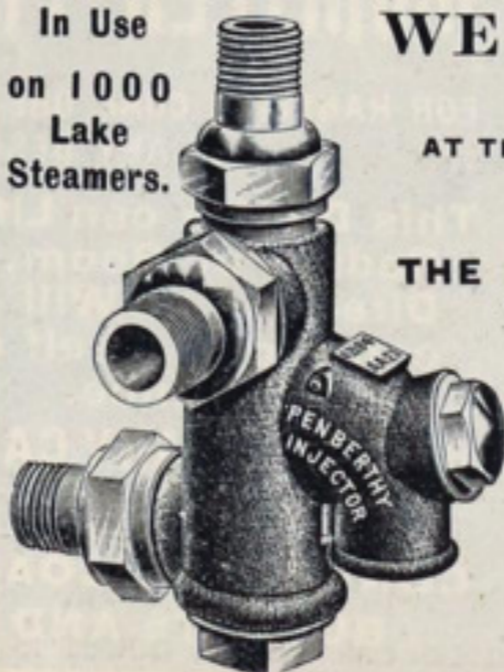
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